

IN THE CLAIMS

Claim 1 (Currently Amended): An aqueous suspension comprising a component (1) comprising one or more pigments, fillers or minerals, and optionally (2) a dispersant polymer to stabilise the rheology of the suspension, wherein,

a) said component (1) comprises a natural carbonate and the reaction product or products of said carbonate with gaseous CO_2 and the reaction product or products of said carbonate with one or more medium-strong to strong H_3O^+ ion-providers, ~~and~~

b) wherein said suspension has a pH greater than 7.5 measured at 20° C, and wherein paper filled or coated by treating with said suspension, at a constant area and thickness, weighs less than paper treated with said suspension but without said reaction products,

wherein the natural carbonate is a natural calcium carbonate (CaCO_3), and
wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-provider
relative to the number of moles of CaCO_3 is in total between 0.1 and 2.

Claim 2 (Canceled).

Claim 3 (Previously Presented): The aqueous suspension according to Claim 1, wherein the strong H_3O^+ ion-provider is selected from the group consisting of hydrochloric acid, sulphuric acid and mixtures thereof, and the medium-strong H_3O^+ ion-provider is selected from the group consisting of H_2SO_3 , HSO_4^- , H_3PO_4 , oxalic acid and mixtures thereof.

Claim 4 (Canceled).

Claim 5 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of between $5 \text{ m}^2/\text{g}$ and $200 \text{ m}^2/\text{g}$.

Claim 6 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 50 and 0.1 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $15 \text{ m}^2/\text{g}$ to $200 \text{ m}^2/\text{g}$.

Claim 7 (Previously Presented): The aqueous suspension according to Claim 6 wherein the pigment, filler or mineral has the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 7 and 0.7 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.

Claim 8 (Previously Presented): A pigment, filler or mineral in the dry state obtained by drying the aqueous suspension according to Claim 1.

Claim 9 (Currently Amended): A process for treating pigments, fillers or minerals in an aqueous suspension, wherein said pigments, fillers, or minerals comprise a natural carbonate, comprising

treating said pigments, fillers or minerals, in an aqueous suspension, with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 to provide ~~a treated aqueous suspension~~ the treated pigments, fillers or minerals,

wherein the final pH of the suspension is greater than 7.5 when measured at 20 °C,

wherein a paper filled or coated with the treated pigments, fillers, or minerals ~~by treating the paper with said treated aqueous suspension~~ weighs less than a paper treated with ~~said aqueous suspension~~ a semi-treated natural calcium carbonate (CaCO_3) treated only with water whose pH, when measured at 20°C, is greater than 7.5, wherein both the paper treated with the treated ~~aqueous suspension~~ pigments, fillers or minerals and the paper treated with semi-treated natural calcium carbonate (CaCO_3) treated only with water whose pH, when measured at 20°C, is greater than 7.5 ~~the aqueous suspension~~ have equal areas and thicknesses,

wherein the natural carbonate is a natural calcium carbonate (CaCO_3), and

wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.1 and 2.

Claim 10 (Previously Presented): The process according to Claim 9, wherein the gaseous CO_2 comes from an external CO_2 supply or from the recirculation of CO_2 or from the continuous addition of the same or another medium-strong to strong provider of H_3O^+ ions as used in the treatment or from an excess pressure of CO_2 .

Claim 11 (Previously Presented): The process according to Claim 9 comprising the following three stages:

- a) treatment with one or more medium-strong to strong providers of H_3O^+ ions

- b) treatment with gaseous CO₂, wherein the treatment with gaseous CO₂ is carried out in a manner selected from the group consisting of concurrent treatment during a), treatment in parallel with a), and treatment after a)
- c) raising of the pH beyond 7.5, measured at 20° C, in a time interval after the end of stages a) and b) of between 1 hour and 10 hours without addition of a base, or immediately after the end of stages a) and b) with the addition of a base, stage c) being the final stage in the process.

Claim 12 (Previously Presented): The process according to Claim 11, wherein stages a) and b) may be repeated several times.

Claim 13 (Previously Presented): The process according to Claim 11, wherein the pH measured at 20° C is between 3 and 7.5 during stages a) and b) of the treatment and the treatment temperature is between 5° C and 90° C.

Claims 14-15 (Canceled).

Claim 16 (Previously Presented): The process according to Claim 11, wherein the duration of stage b) of the treatment is between 0 hours and 10 hours.

Claim 17 (Previously Presented): The process according to Claim 9, wherein the pigments, fillers, or minerals comprising a natural carbonate are selected from the group consisting of a natural carbonate, a carbonate containing a dolomite, mixtures thereof with talc, mixtures thereof with kaolin, mixtures thereof with titanium oxide (TiO₂), magnesium

oxide (MgO), and other minerals which are inert towards medium-strong to strong H_3O^+ ion-providers.

Claim 18 (Previously Presented): The process according to Claim 17, wherein the natural carbonate is a marble, a calcite or a chalk.

Claim 19 (Previously Presented): The process according to Claim 9, wherein the strong provider or providers of H_3O^+ ions is hydrochloric acid or sulphuric acid and the medium-strong provider or providers of H_3O^+ ions is selected from the group consisting of H_2SO_3 , HSO_4^- , H_3PO_4 and oxalic acid.

Claim 20 (Previously Presented): The process according to Claim 11, further comprising the addition of a dispersing agent and optionally a reconcentration stage, after the third stage of treatment.

Claim 21 (Previously Presented): A treated aqueous suspension comprising treated pigments, fillers, or minerals,

wherein the treated pigments, fillers, or minerals comprise a natural carbonate, and

wherein the treated aqueous suspension is produced by the process of Claim 9.

Claim 22 (Previously Presented): The treated aqueous suspension according to Claim 21, wherein the pigments, fillers, or minerals comprising a natural carbonate are selected from the group consisting of a natural carbonate, a carbonate containing a dolomite, mixtures thereof with talc, mixtures thereof with kaolin, mixtures thereof with titanium oxide (TiO_2),

magnesium oxide (MgO), and other minerals which are inert towards medium-strong to strong H_3O^+ ion-providers.

Claim 23 (Previously Presented): A pigment, filler or mineral in the dry state, obtained by drying an aqueous suspension according to Claim 21.

Claim 24 (Currently Amended): ~~A preparation for use in paper making, comprising at least one aqueous suspension according to~~ The composition of Claim 1, further comprising a dispersant polymer.

Claim 25 (Previously Presented): A process for coating paper comprising applying the aqueous suspensions as claimed in Claim 1 onto a sheet of paper.

Claim 26 (Currently Amended): A process for making a paper sheet with a paper filler ~~comprising manufacturing a sheet of paper with the aqueous suspension solution claimed in Claim 1,~~

the process comprising:

diluting a wood and fibre pulp or paste, with water, in the presence of the aqueous suspension of Claim 1 to form a mixture,

agitating the mixture, and

forming the paper sheet from the mixture

~~wherein the paper treated with the aqueous solution, wherein the aqueous solution was modified as described in a) before treating the paper, weighs less than a second paper of equivalent area and thickness treated with the aqueous solution, wherein the aqueous solution used to treat the second paper was not modified as described in a).~~

Claim 27 (Currently Amended): The process of Claim 26, further comprising, after forming the paper sheet, drying the formed paper sheet ~~A process for coating and manufacturing a sheet of paper comprising coating and impregnating, in any order, a sheet of paper with the aqueous solution claimed in Claim 1 wherein said aqueous solution acts as a paper filler and as a preparation for coating and pigmentation of the surface of the paper.~~

Claim 28 (Currently Amended): The process as claimed in Claim 26, further comprising, after agitating the mixture, adding a retaining agent ~~wherein the weight of the paper produced is reduced by 3% to 15% relative to the weight of the second paper.~~

Claim 29 (Currently Amended): A ~~paint or coating~~ composition comprising the aqueous suspension ~~solution~~ as claimed in Claim 1 and a paint or a coating.

Claim 30-32 (Canceled).

Claim 33 (Currently Amended): A process for manufacturing a sheet of paper or board, comprising

the process comprising:

diluting a wood pulp or paste, with water, in the presence of the aqueous suspension of Claim 1 to form a mixture,

agitating the mixture, and

forming the paper sheet or board from the mixture.

~~incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said sheet is obtained from~~ wherein the sheet or board comprise cellulose fibres made from wood.

Claim 34 (Currently Amended): A process for manufacturing a sheet of paper or board,

the process comprising:

diluting a pulp or paste, with water, in the presence of the aqueous suspension of

Claim 1 to form a mixture,

agitating the mixture, and

forming the paper sheet or board from the mixture,

~~-comprising incorporating a suspension or preparation according to Claim 1 in the process of manufacture of said sheet wherein said sheet or board is obtained from~~ comprise fibres not originating from wood.

Claim 35 (Currently Amended): A paper or board obtained by the process as claimed in Claim 33 ~~Claim 30~~.

Claim 36 (Previously Presented): A method of printing comprising digitally applying ink onto the paper or board claimed in Claim 35.

Claim 37 (Previously Presented): The aqueous suspension claimed in Claim 1 wherein the natural carbonate is selected from the group consisting of marble, calcite, chalk and carbonate containing dolomite.

Claim 38 (Currently Amended): The aqueous suspension according to Claim 1 ~~Claim~~ 4, wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.25 and 1.

Claim 39 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.

Claim 40 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.

Claim 41 (Previously Presented): The aqueous suspension according to Claim 6, wherein the pigment, filler or mineral presents the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 25 and 0.5 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.

Claim 42 (Previously Presented): The process as claimed in Claim 10, wherein the CO_2 pressure is from 0.05 to 5 bars.

Claim 43 (Previously Presented): The process as claimed in Claim 11, wherein the raising of the pH beyond 7.5, measured at 20°C , in a time interval after the end of stages a)

and b) of between 1 hour and 5 hours without addition of a base, or immediately after the end of stages a) and b) with the addition of a base, stage c) being the final stage in the process.

Claim 44 (Previously Presented): The process as claimed in Claim 13 wherein the treatment temperature is between 45 and 60°C.

Claim 45 (Previously Presented): The process as claimed in Claim 16 wherein the duration of stage b) of the treatment is between 2 hours and 6 hours.

Claim 46 (Currently Amended): A composition comprising a paint or coating and the aqueous dispersion of Claim 24 ~~preparation for use in paper making, comprising at least one aqueous suspension according to Claim 21.~~

Claim 47 (Previously Presented): A process for coating paper comprising applying the aqueous suspension as claimed in Claim 21 onto a sheet of paper.

Claim 48 (Currently Amended): A process for making a paper sheet with a paper filler comprising,

the process comprising:

diluting a pulp or paste, with water, in the presence of the treaded aqueous suspension of Claim 21 to form a mixture,

agitating the mixture, and

forming the paper sheet from the mixture

~~manufacturing a sheet of paper with the aqueous suspension claimed in Claim 21.~~

Claim 49 (Currently Amended): A process for coating and manufacturing a sheet of paper comprising coating and impregnating, in any order, a sheet of paper with the aqueous ~~solution~~ suspension claimed in Claim 21 wherein said aqueous ~~solution~~ suspension acts as a paper filler and as a preparation for coating and pigmentation of the surface of the paper.

Claim 50 (Canceled).

Claim 51 (Currently Amended): A process for manufacturing a ~~sheet of paper or~~
board,

the process comprising:

diluting a pulp or paste, with water, in the presence of the treated aqueous suspension
of Claim 21 to form a mixture,

agitating the mixture, and

forming the board from the mixture,

~~-comprising incorporating a suspension or preparation according to Claim 21 in the~~
~~process of manufacture of the sheet in terms of a preparation of a thick stock or a thin stock~~
~~or both, one or more times.~~

Claim 52 (Canceled).

Claim 53 (Previously Presented): The process claimed in claim 33 wherein said cellulose fibers are from a deciduous or resinous wood.

Claims 54-60 (Canceled).

Claim 61 (New): A process for manufacturing a sheet of paper or board,
the process comprising:
diluting a pulp or paste, with water, in the presence of the pigment, filler, or mineral
of Claim 21 to form a mixture,
agitating the mixture, and
forming the sheet of paper or board from the mixture.